Weekly Safety Briefings

Week 19: May 5 – May 9, 2025

Electrical Safety

Introduction

Electricity plays a pivotal role in our daily lives whether at work or at home. We often take advantage of it and sometimes don't give it the consideration it deserves. Electricity is a powerful tool but can be deadly if not handled properly. This week we will be focusing on understanding the basics of electrical safety.

Monday- Basics of electricity

All electrical systems have the potential to cause harm. Electricity can be either "static" or "dynamic." Dynamic electricity is the flow of electrons through a conductor (this is known as electric current). Conductors are materials that allow the movement of electricity them. Examples include most metals or the human body.

For electrical current to exist, it must have an unbroken path or loop. When you plug in a device, like power tools or electronics, the electricity takes the easiest path from the plug, to the device, and back to the power source. This is action is also known as creating or completing an electrical circuit.

Tuesday – It's the current that kills

Initially you might think a shock of 10,000 volts would be more deadly than 100 volts but it's not so! The real measure of shock's intensity lies in the amount of current (amperes) forced through the body. Any electrical device used on a house current can, under certain circumstances, transmit a fatal current.

While any amount of current over 10 milliamps (0.01amp) is capable of producing painful shock, currents between 100 and 200 mA (0.1 to 0.2 amp) are lethal. Currents above 200 milliamps (0.2 amp), while producing severe burns and unconsciousness, do not usually cause death if the victim is given immediate attention such as CPR.

This may not seem logical but the reason this occurs is due to the reaction of the heart muscles. As the current approaches 100 milliamps, ventricular fibrillation of the heart occurs – an uncoordinated twitching of the walls of the heart's ventricles which often results in death. Above 200 milliamps, the muscle contractions are so strong that the heart is forcibly clamped down during the shock, which protects the heart from going into ventricular fibrillation. The chances for survival are better in this case.

Wednesday – Types of injuries and how they can happen

There are four main types of injuries involving electrical currents:

- Electric shock
- Burns
- Falls
- Electrocution

How do they happen?

- Direct contact with exposed electrical circuits or energized conductors.
- Electricity arcs (due to exposed energized conductors or circuit) circulating in the air can pass through a person who is grounded.
- If the skin gets in touch with the heat generated from electric arcs, it burns the internal tissues.
- The light emitted from an electric arc flash (UV and IR) can cause damage to the eyes.
- When the potential pressure is released from an arc flash, there is an arc blast, which can collapse your lungs, cause physical injuries, or create noise that can damage hearing.

Thursday – Common Electrical Hazards

Understanding common electrical hazards can help you identify areas for improvement in your surroundings and prevent future injury. Here are several examples:

- Poorly installed, faulty and/or ill-maintained electrical equipment.
- Faulty wiring.
- Overloaded or overheated outlets.
- Use of flexible leads and extension cables.
- Incorrect use of replacement fuses.
- Use of electrical equipment with wet hands or near the source of water.

Friday – Tips to prevent workplace electrical incidents

So far this week, we've discussed how dangerous electricity can become if not handled properly. Electricity is necessary to for nearly all businesses to continue operating. Lastly and perhaps most importantly, we are going to discuss tips for preventing workplace injuries:

- Unplug or switch off electrical appliances when not in use or while cleaning, repairing or servicing.
- Ensure that all electrical appliances are turned off at the end of the day.
- Don't forcefully plug into an outlet if it doesn't fit.
- Refrain from running electrical cords across doorways, under the carpets, or in areas that witness regular activities.
- Maintain a clearance of at least 3 feet from all electrical panels.
- Use only equipment that is double-insulated and properly grounded.
- Don't overload the outlets.
- Ensure that two extension cords are not plugged together.
- Only use electrical equipment that is approved by a national testing laboratory.
- Pay attention to the warning signs. Equipment may heat up, spark, smoke or make weird noise; Identify the signs and immediately take it out of service.
- Regularly check for defects in cords and equipment. Report immediately if any and take out of service.
- While unplugging, grip the plug and pull. Don't pull the cord from a distance.
- Do not use electrical equipment or appliances with wet hands or near water and wet surfaces.
- Clearly identify potential electrical hazards, such as electrical panels, with appropriate safety signs.